Food security among the Orang Rimba in Jambi: transformation processes among contemporary Indonesian hunter-gatherers

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An Orang Rimba woman in Pengelaworon brings firewood for cooking, 2014

I Introduction

One sunny afternoon in June 2012, an Orang Rimba youth offered me a ride to Terab on his motorcycle. The drive from Bukit Suban to the eastern part of National Park Bukit Duabelas (Taman Nasional Bukit Duabelas, TNBD) took us four hours, which came on top of the previous day's six-hour car journey from Jambi City. Once I had settled in, my driver returned to Bukit Suban, leaving me with the Orang Rimba of Terab.

I spent that first evening surrounded by children, who helped me to prepare my dinner. After having shared my meal with them, I walked up the stairs to the second floor where I rested until I was woken up by the voices of people entering the house. As sunset beckoned, followed by nightfall, a group of about twenty adults, who were wearing loincloths, arrived. Some of them had come by motorbike, others on foot. Later, I learned that they are a group of the Orang Rimba from Kejasung Kecil led by Tumenggung[1] NG who paid regular visits to the house since the first floor was used to store property owned by the *tumenggung*, such as a television, a DVD player, and a generator. In addition, the house was surrounded by other things which were hung on *sesudungons*[2] located to the left of the house, near the rubber trees. Most of this property had been acquired using money that the *tumenggung* had collected from selling rubber and oil palm fruits, or from the monthly salary from the plantations, and income from hunting and gathering.

I walked down the stairs to the first floor where I met *tumenggung*, who had just arrived in the house accompanied by his two wives, children, and other relatives. As they entered the house, they made an effort to switch on the gasoline-powered electric generator. As soon as they managed to get it running, people got busy trying to recharge their mobile phones[3] and turning on the television set. That night, *tumenggung* and his people

[1] *Tumenggung* is a group leader of the Orang Rimba.

[2] *Sesudungon* are huts constructed from four wooden posts with a roof of plastic or leaves (see Chapter II).

[3] Together with motorbikes, mobile phones are becoming more popular among the Orang Rimba and both are seen as practical in the new environment as they facilitate economic activities. Motorbikes are a crucial mode of transport, while mobile phones are important for communication. For instance, some members offer their services as *ojek* drivers (motorbikes for rent) for people who travel to and from the group, such as NGO workers, activists, researchers, and members of neighboring Malay or transmigrant communities. Mobile phones are used to communicate with middlemen about demand and prices for Non-Timber Forest Products (NTFPs) and palm oil fruits.

watched 1990s Indonesian martial arts films on the DVD player. I joined them for about two hours. While we watched the films, I had a conversation with *tumenggung*, his second wife and other people about my research; meanwhile, the children imitated the martial arts moves being played out on the screen.

1.1 Research problem

While reflecting on the first few nights in the field, my thoughts went back to the year 2006, when I conducted my first ethnographic research on the Orang Rimba in another location, namely in Pamenang, a village in the district of Merangin Regency, in central Jambi. At that time, in the final days of my fieldwork, I was a witness to the dilemma that the Orang Rimba face. Today, they live in the resettlement housing provided by the government with very limited sources of livelihood. They struggle to maintain their unstable income that largely comes from collecting rubber seeds and hunting wild pigs. They make choices about how to spend their limited money on daily needs.

The advent of many changes has forced the Orang Rimba to alter their livelihoods as pressure has intensified on their nomadic lifestyle as their land shrinks. Forest degradation has reduced the Orang Rimba's access to resources inside the forest since the 1970s. Thus, they have had to make culturally costly adjustments and adaptations. For instance, in some cases, this has included a shift towards leading sedentary lives.

My dissertation is tailored towards capturing these transformation processes among the Orang Rimba in Jambi Province (Sumatra, Indonesia) through the lens of food security. This specific focus on patterns of food production and consumption among hunters-gatherers, and among the Orang Rimba in particular, is important and appropriate for several reasons.

First, both within and outside Indonesia, there is concern about the impacts of above-mentioned processes of forest degradation and land conversion on forest-dependent peoples' diets. While the relationship between forest cover and food security is not yet fully understood, it is clear that healthy forests make important contributions to local diets (Dounias and Froment 2011; Ickowitz et al. 2016; Rowland et al. 2016). So far there is little empirical work that investigates how deforestation affects the quality and quantity of forest-dependent peoples' diets, but the available evidence suggests that dietary diversity is negatively impacted by forest loss (et al. 2018). Thus, the reduced ecological diversity and abundance of forest resources that form important components of Orang Rimba diets, poses a potential challenge to food security.

Second, given these effects of forest degradation, contemporary hunter-gatherers combine their forest-based livelihoods with a range of other income-generating activities (Kelly 2013; Fortier 2018; Reyes-García et al. 2019). In the case of the Orang Rimba this includes maintaining rubber and oil palm plantations. With the increasing importance of cash income earned from these activities, it becomes important to ask how this economic change is reflected in dietary change. The availability of cash might lead to richer, more abundant or more varied diets, and thus have a positive impact on food security. However, the fast integration of previously subsistence-oriented societies into a cash economy, is known to often result in one-sided diets in which imported, high-energy, but nutrition-low

food is overrepresented (Haddad et al. 2015; WHO 2017; Albert et al. 2020).
Third, alongside rapid forest loss and forest degradation, the processes of change of which the Orang Rimba and other hunter-gatherer peoples are part, also include forest conservation. As is clear from the reflections introducing this chapter, part of the people featuring in this study live within the boundaries of a protected area, the Bukit Duabelas National Park. This raises questions about the position of indigenous peoples in protected areas, and the effect of conservation initiatives on their access to food in particular (see Lewis 2016; Colchester 2018; Heim 2020).

Despite the importance of these interlinked topics, they are rarely discussed in relation to the Orang Rimba, as is evident from the relatively limited number of publications on these topics. Thus, my dissertation aims to contribute to filling these gaps by looking at how processes of environmental and social change are reflected in what the Orang Rimba eat, how and from where they obtain their food, and what this means for their food security. These transformation processes are visible not only in their involvement in the cash market, the growing of cash crops, and their participation in the development process, but also in their identity and social relations. With respect to identity, this dissertation explores the dilemma the Orang Rimba face in terms of whether they remain hunter-gatherers or become farmers. While the Orang Rimba still hold on to hunting and gathering, and to their traditions and culture, they also engage in rubber and oil palm cultivation as farmers, employees, and middlemen. These changes are the result of, but also give rise to, altered social relations within and outside Orang Rimba society. This is especially so as many Orang Rimba nowadays live on the forest edge, where interaction with Malay people, the majority population in Jambi, and transmigrants from Java has become unavoidable. These interactions take place in a wider context of a development policy that is based on forest exploitation, plantation agriculture, and transmigration on the one hand, and forest conservation on the other hand. It is, therefore, necessary to look at the interaction between the Orang Rimba, the Indonesian state, forestry and agricultural companies, neighboring ethnic groups, conservation agencies/efforts, and non-governmental organizations (NGOs).

The main question I aim to answer in this dissertation is: *What are the patterns of food production and consumption among different Orang Rimba groups and how do these patterns relate to their food security?* In addition, I answer the following sub-questions:

1. What do the Orang Rimba eat?
2. How do they obtain their food?
3. To what extent are the Orang Rimba food (in)secure?
4. How do they adjust their modes of livelihood under changing environmental and social conditions?

Through answering these questions, my dissertation examines both the external and internal factors that shape the ongoing transformation processes among the Orang Rimba and, consequently, their food security. It shows that after all, the Orang Rimba cannot be described as passive actors. They participate actively in the development process and experience its attendant benefits and demerits. At the same time, they have only to a

very limited extent become politically or economically involved beyond their traditional territories. I argue that, rather than attempting to change the outside world, it is by adapting to changing circumstances that the Orang Rimba mitigate the impact of the development process on their lifeways. However, as I will show, adaptation strategies considerably differ within the Orang Rimba population.
This dissertation has six chapters in which Chapter I introduces the research outline, the research questions, the key concepts related to food (in)security, and the methods used during the fieldwork. It also describes in broad terms the field sites of the Orang Rimba in which the research was executed.

Chapter II first discusses the Orang Rimba's connections with the outside world and the transformation processes that have taken place among the Orang Rimba, including government efforts to resettle the Orang Rimba, before turning to the contemporary social, cultural, and economic conditions that characterize the Orang Rimba's way of life. These also include the large-scale logging operations and establishment of oil palm and rubber plantations. This chapter includes a discussion of the role of the national park and NGOs in the livelihoods of the Orang Rimba.

Chapters III, IV, and V are dedicated to the presentation and analysis of the results from my ethnographic research of the three Orang Rimba groups, namely the Sako Tulang group, the Terab group, and the Air Hitam group. The presentation of ethnographic information on their livelihoods and social situation, combined with the analysis of their daily food intake, is the core of each of these three chapters.

Chapter VI provides a comparative analysis of food security among the three Orang Rimba groups in relation to their respective ethnographic characteristics and livelihood strategies, and highlights both the differences and commonalities between the groups. It also offers the conclusion and reflects on the Orang Rimba's heterogeneous situation in relation to the existing literature and food security frameworks.

1.2 The Orang Rimba at a glance

Most Orang Rimba live in Jambi Province, although they are also present in surrounding provinces such as Riau, South Sumatra, and West Sumatra (see Prasetijo 2015). Within Jambi, the Orang Rimba live on undulating land that lies between Batanghari River and the foothills of Bukit Barisan Mountain range. They settle in small groups in forested areas and reside along river branches or tributaries that support their livelihoods. Their main living areas are (see Prasetijo 2011, Sandbukt and WARSI[4] 1998): (1) inside the Taman Nasional Bukit Duabelas (TNBD) or Bukit Duabelas National Park, which is the focus of this study; (2) around Taman Nasional Bukit Tiga Puluh (TNTP) or Bukit Tigapuluh National Park in northern Jambi; and (3) along the Trans Sumatra Highway in southern Jambi (see Figures 1 and 2).

[4] During my fieldwork, I got tremendous assistance from a local non-governmental organization named KKI WARSI, hereafter referred to as Warsi.

Figure 1. Map of Indonesia highlighting Jambi Province
Source: www.id.emb-japan.go.jp, accessed 24 Sept 2018

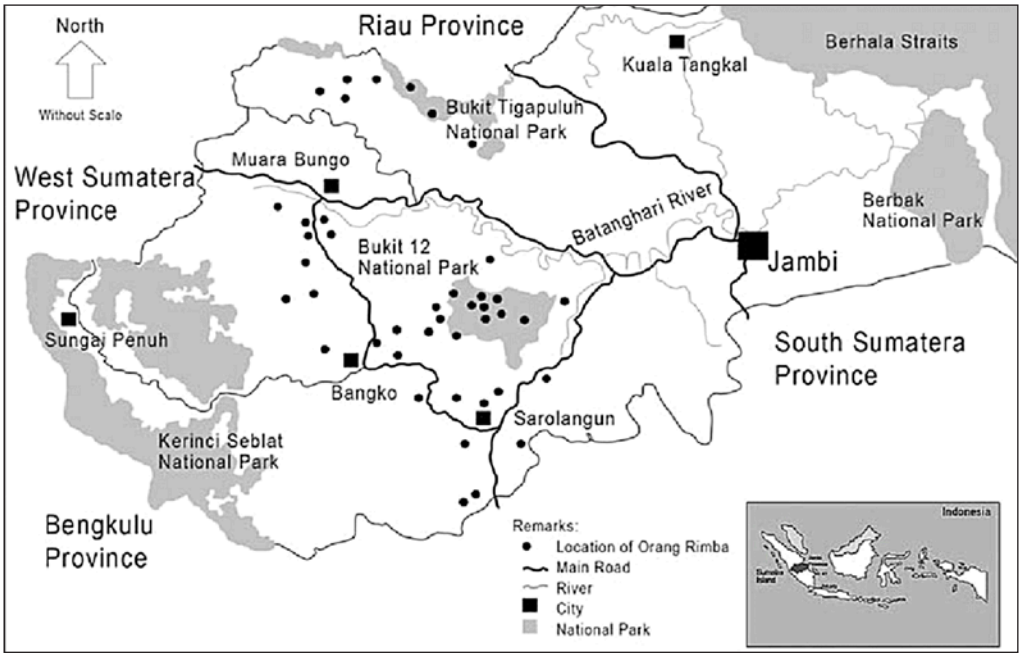

Figure 2. Location of the Orang Rimba in Jambi Province
Source: GIS Department of WARSI

The first area, Bukit Duabelas, has been impacted by transmigration and forest degradation due to operations of logging companies. The central and eastern parts of the protected area, however, are still thinly covered with forest. No matter how small the area is, the hills of Bukit Duabelas and the areas close to the Batanghari River have provided some protection to the forest on which the Orang Rimba depend for their livelihood. The second area is the buffer zone of the Bukit Tigapuluh National Park, which is situated

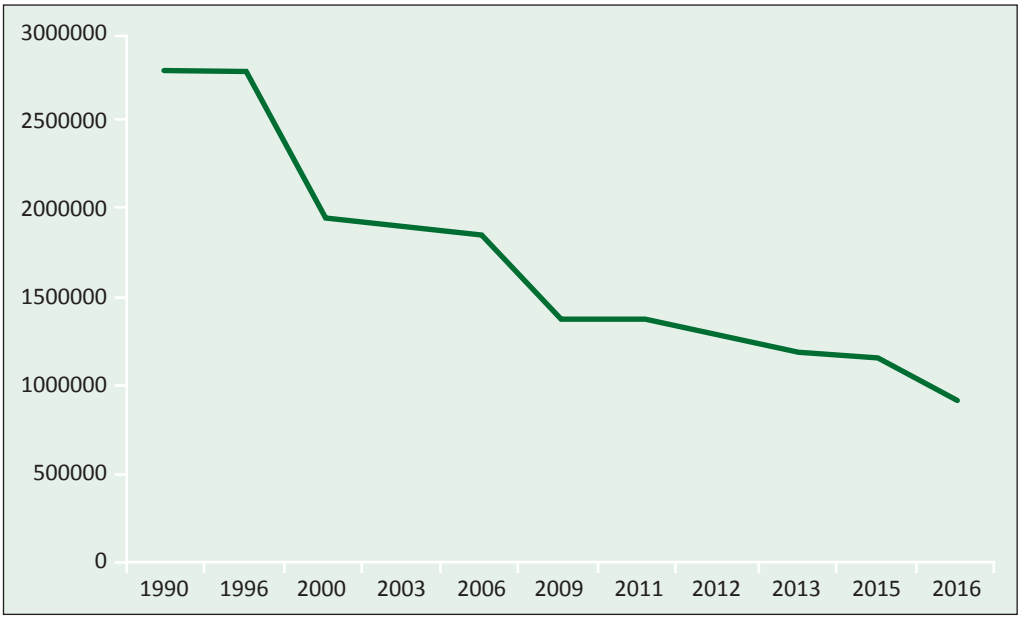

Figure 3. Forest cover in Jambi, 1990-2016 (ha)
Source: data from Ministry of Forestry, various years; graph was developed by the author

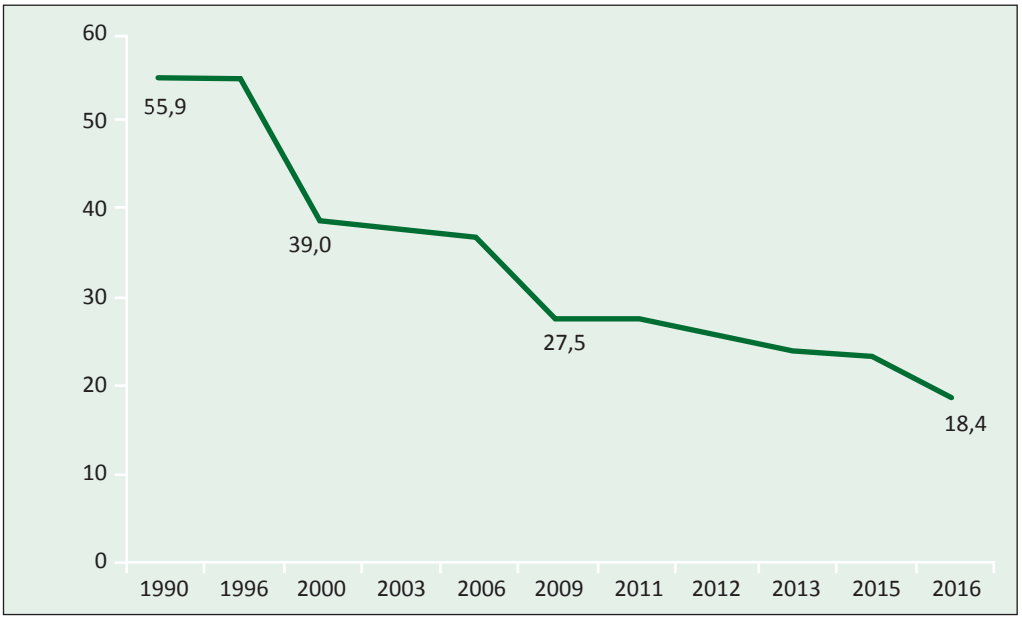

Figure 4. The decline of forest cover in Jambi, 1990-2016 (%)
Source: calculated by the author

around Batanghari River and the Bukit Tigapuluh. This forest is under serious threat from timber operations (both legal and illegal) and large-scale conversion for plantation agriculture, which has been going on for a long time.

The third area, which is situated between the Tembesi River, the Merangin River, and the Trans Sumatra Highway, has changed drastically due to the transmigration projects of Kubang Ujo and Pamenang that were carried out in the 1970s, and which were followed, first, by logging operations in the 1980s, and thereafter by the development of oil palm plantations. As farmers living around the forest rapidly opened up areas in the periphery of the transmigration areas to secure arable land, within a short time the Orang Rimba lost almost all of their traditional economic resources (Sandbukt and WARSI 1998).

It is difficult to estimate the total Orang Rimba population since updated census data are not available. In 2008 WARSI estimated the total number of the Orang Rimba in Jambi Province to amount to about 3,650 people (WARSI 2009). In 2010, WARSI and BPS Indonesia jointly did another census, but this only covered the Bukit Duabelas area. This census estimated the total number of the Orang Rimba in the park at about 1,775 people (BPS and WARSI 2011). They are currently divided over 13 subgroups that live inside, surrounding and outside the Bukit Duabelas Forest. As I will explain in section 1.5, from these I chose three groups as the main focus of my research.
Jambi is one of 34 provinces in Indonesia and covers an area of 50,058 km2 or about over 5 million ha (BPS 2017). While most of this area used to consist of rainforest, since the 1970s forest cover has declined to a worrying degree (see Prasetijo 2017). No public data are available for the 1970s, however, based on data derived from the Ministry of Forestry for the period of 1990 up to 2016, it can be said that forest cover fell from roughly 2.7 to around 1 million ha between 1990 and 2016 (Figure 3). If we compare forest cover during the 1990-2016 period with the total area of Jambi, it can be said that forest cover has declined from 55.9% in 1990 to 18.4% in 2016 (Figure 4). This equals a decline of around 37.5% in a 26-year period.

The gradual development of a road infrastructure since the Sukarno era up to the Suharto era contributed to the rapid forest degradation and increased pressure on the natural resources in Jambi. Prior to the construction of the highways, the people of Sumatra, and specifically those in the Jambi area, relied on the Batanghari River as a mode of transportation. As more roads were built, access to the forest became relatively easy, fueling the development of the wood industry in the area, to meet the rapidly increasing demand for wood products on the domestic and international markets (Siagian 2007). Today, the population of Jambi is comprised predominantly of Malay people and transmigrants from Java. Using data from the Statistics Indonesia or *Badan Pusat Statistik* (BPS) in 2000, we see that the dominant population is Malay, followed by Javanese and

Kerinci (see Table 1). Indigenous groups[5] such as the Orang Rimba, Talang Mamak and others form less than 10% of the population (Prasetijo 2015).

Table 1. Jambi population based on ethnic composition, 2000 (in numbers and percentage)

No.	Ethnic Groups	Numbers in 2000	% of Population
1.	Malay Jambi	994,290	41.4
2.	Kerinci	254,125	10.6
3.	Javanese	664,931	27.6
4.	Minangkabau	131,609	5.5
5.	Sundanese	62,956	2.6
6.	Bugis	62,185	2.6
7.	Others (including 'indigenous groups' such as Penghulu, Pindah, Talang Mamak, Batin, Orang Rimba and Bajau)	235,282	9.7
	Total Population	**2,405,378**	**100**

Source: Prasetijo, 2015: 42

The Orang Rimba prefer to be referred to as "Orang Rimba", which literally means 'People of the Forest' (see Prasetijo 2015, Wardani 2011). This is because, to them, living in the forest signifies a proud way of life characterized by a harmonious co-existence with the forest. It is this relationship that enables them to preserve their culture in its entirety with all the attendant traditions, customs and taboos. In the past other ethnic groups and scholars have tended to refer to the Orang Rimba as the Orang Kubu. However, this has negative social connotations, as it is associated with being dirty, vile, smelly, stinky, wild, primitive, and magical. This general perception is wide-spread; for many people in Jambi and beyond, the Orang Rimba are equal to a small minority group that is backward, poor, nomadic, and living an uncivilized lifestyle in the forest. It is this negative perception that has led to the implementation of policies that have been detrimental to various aspects of their lives, including their livelihood.

The Orang Rimba prefer to call people they consider outsiders "Orang Terang (People of the Light)", which means non-forest dwellers, who lead a way of life that is different from theirs. In this dissertation, I will use the term Orang Terang to generally refer to people other than the Orang Rimba. I use this term as people in my research locations used it in daily life. The term was used to describe transmigrants (people who were migrated from

[5] The concept of 'indigenous peoples' is somewhat ambivalent in Indonesia. Until recently, the government used other concepts like 'isolated tribes' (*suku-suku terasing*). In recent years, and under the influence of the international discourse on 'indigenous peoples', the government has now adopted the concept of '*adat* communities' (*masyarakat adat*). In line with use of the concept of 'indigenous peoples' by the international bodies of the United Nations (UN), the indigenous movement in Indonesia, and most researchers, I also use this concept to refer to the non-dominant ethnic groups in Indonesia like the Orang Rimba. As my focus is on food security among the Orang Rimba, I have decided to discuss this political issue only when it affects the Orang Rimba directly, such as in relation to the government's resettlement policies. The Orang Rimba also do not play an important role in the country's indigenous peoples' movement.

Java, Bali, and Madura, as well as migrants from other areas to Jambi), and other ethnic groups. That said, in other contexts, I will use the term "other ethnic groups" or mention a particular ethnic identity in the discussion of specific groups such as the Orang Melayu or the Orang Dusun (Malay People), the Orang Jawa (Javanese), and the Orang Sunda (Sundanese).

While most Orang Terang are farmers, the Orang Rimba are to a large extent hunter-gatherers. That is, hunting, fishing, gathering, and (barter) trade are prominent components of the Orang Rimba livelihoods, even though various forms of (plantation) agriculture are gaining importance. In addition, the Orang Rimba have distinct value systems, cultural practices and traditions, many of which reflect the central role of the forest in Orang Rimba lives. Of particular importance is the practice of *melangun*, a set of taboos and mobility rules related to death and mourning (see Chapter II).

This dissertation will also extensively discuss the livelihood of the Orang Rimba, their interaction with other groups, and the impact of development processes in Jambi on their livelihood that can be referred to as follows. Basically, the Orang Rimba lead what to some may seem a unique lifestyle owing much to the values and traditions they espouse, which can be traced back many centuries. It is a lifestyle that is in sharp contrast with those espoused by other communities. The uniqueness in their value system is reflected in their traditions, in the food they eat, in the shelters they use to serve as housing, and in the methods they employ in cultivation. They for instance eke a living by gathering forest products and hunting forest animals, some of which they sell to local markets to earn money they need to buy an array of basic necessities. However, their lifestyle is strongly affected by external developments.

The most important source of change came about after the construction of the Trans Sumatra Highway, which turned the region into a one of the destinations for transmigrants[6] and forests started to be carved into large-scale plantations. Transmigration, manifested in Kubang Ujo and Pamenang transmigration projects, has had serious effects on all areas inhabited by the Orang Rimba. Forests, which were still abundant during the 1980s, had by the 1990s succumbed to oil palm and rubber plantations. Initially, the Orang Rimba created a rim around the place where they lived to protect forests for their future use. However, with in a very short time, the Orang Rimba realized that they had lost almost all of their traditional economic resources, in terms of natural forests or secondary vegetation which served as area for growing fruits. No compensation was offered for this loss. Nowadays, most of the Orang Rimba live by cultivating small plots of land on which they used to grow rubber plants.

The influx of transmigrants coupled with logging and monoculture agriculture activities, legal and illegal alike, by worsening forest degradation and decimation of biodiversity, has reduced the Orang Rimba's availability of and access to economic resources. To

[6] Transmigrants are people in the program inherited by the Dutch colonial government and adopted by the Indonesian government to move people who are landless and living in densely populated areas (mostly from Java Island, to a lesser extent from Bali and Madura) to outer islands such as Kalimantan, Maluku, Papua, Sulawesi, and Sumatra under the coordination of the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration.

supplement decreasing economic resources as the forests decreased, the Orang Rimba have had to make often culturally costly adjustments and adaptations. These have included attempts to lead sedentary lives, by starting to cultivate oil palms and rubber trees, as well as engaging in selling and buying other commodities through intermediaries.
At the same time, the range of basic necessities has been rising over time in line with more interaction with other communities. However, many aspects of life that seem normal to communities outside the Orang Rimba, more often than not constitute taboos to be avoided as much as possible. This sets off the background for acrimony-plagued inter-ethnic relations between the Orang Rimba on the one hand and other communities on the other.

1.3 Hunter-gatherers

Before discussing the concept of food security in relation to hunter-gatherers, which is at the heart of this dissertation, it is useful to first briefly reflect on several other concepts and ideas that appear in anthropological research on hunter-gatherers more generally.
In defining hunter-gatherers, I follow Kelly (2013:2), who describes them as: '[…] people […] who do (or did) procure much if not all of their food from hunting, fishing, and gathering. But […] many of these "hunter-gatherers" grow some of their own food, trade with agriculturalists for produce, or participate in cash economies." Importantly, Kelly further emphasizes that hunter-gatherers are not just defined economically, but socially as well. Moreover, like their economic characterization, the social characteristics of hunter-gatherer societies have been changing: "Through the years, thought/thinking/theorizing about the archetypal hunter-gatherer society changed from a closed, patrilineal horde to bilateral bands with fluid membership; from 'Man the Hunter' to 'Woman the Gatherer'; from egalitarian bands to rural proletariat; from isolated Paleolithic relics to marginalized members of the contemporary world system" (Kelly 2013:2).
By Kelly's definitions and characterizations, the Orang Rimba can indeed be classified as hunter-gatherers, as has been the general conclusion of previous anthropological writings on the Orang Rimba (see Sandbukt 1988, Persoon 1989, Soetomo 1995, Weintre 2003, Sager 2008, Prasetijo 2011, and Elkholy 2016) and as will be further confirmed in the following chapters. Moreover, as Minter has shown for the Philippine Agta (2010), Kelly's definition is particularly appropriate in the discussion of contemporary hunter-gatherers, since it views hunting and gathering as a dynamic continuum rather than a static state. The use of the term does also not completely exclude the practice of any form of agriculture by these communities (see also Fortier 2018; Griffin 2018; Reyes-García et al. 2019).
An important distinction within the broad category of hunter-gatherers is between primary (or continuous) versus secondary (or re-specialized) hunter-gatherers. The large majority of contemporary hunter-gatherer peoples belong to the group of primary hunter-gatherers, who are considered to have continuously followed a hunting and gathering mode of existence from prehistory up to the present. In contrast, for secondary hunter-gatherers, it is a relatively recent adaptation and a move away from an agricultural mode of production. Explanations for the existence of secondary hunter-gatherers are the occurrence of environmental crises that lead to the occupation of a new environment, as does conflict, or retreat from colonizing forces. Examples of such secondary hunter-

gatherers include the Thai Mlabri and the Punan of Borneo (Layton 2001; Bellwood 1999; Oota et al. 2005; Hoffman 1984; and Endicott 1999).
It is generally assumed that the Orang Rimba, too, belong to the group of secondary hunter-gatherers (Persoon 1989). The main arguments for this idea are their genetic similarity to neighboring Malay peoples; their accumulation of wealth, notably in the form of cloth, which is unusual for primary hunter-gatherers; linguistic similarities with neighboring ethnic groups; and their stratified political organization (Chapter 2).

1.4 Food and livelihood security

In discussing the food security of the Orang Rimba, I will use both mainstream quantitative approaches and qualitative, anthropological perspectives. The mainstream standard, generally determined by international organizations, is a benchmark for measuring food security, using a set of indicators. On the other hand, using an anthropological perspective, based on an ethnographic approach, helps to analyze the qualitative context of food security and the transformation processes the Orang Rimba are currently going through (Koentjaraningrat 1979; Laksono 2002; Tsing 2005).

The mainstream standard
The concept of food security remains a source of debate as individuals and organizations differ in the definitions and approaches they adopt in this regard. With this in mind, a review of some of the definitions used and approaches adopted by organizations and individuals involved in the role food security plays in today's world is necessary. In 1996, the World Bank simply defined food security as "Access by all people at all times to enough food for an active, healthy life" (World Bank 1996). Meanwhile, the definition of food security adopted during the Plan of Action of the World Food Summit, held in Rome in November 1996, states that "Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2006: 1). Interestingly, and relevant for this thesis, over the years the notion of food preferences has thus gained importance in the definition of food security.
Food security took center stage in the 1970s (Limenta and Chandra 2017, FAO 2006, Lasa 2005). At the time, the concept of food security emphasized the availability of food in general and cereals in particular, at the national and international level. This was largely attributable to the 1972–1974 world food crises. The approach informed the gist of the food security policy adopted by the then fledgling Government of Indonesia (GoI), which focused on food provision and was known, alternatively, as the Food Availability Approach (FAA). Food security then was closely associated with achieving food self-sufficiency (Limenta and Chandra 2017, Lasa 2005). As a result, it paid little attention to access to food and to its distribution. The approach was underpinned by the assumption that food availability, within a context of efficient trading, automatically ensures its distribution to all regions in the country. Additionally, it was also assumed that food prices were stable and set at fair levels affordable to all families. Nonetheless, sufficient food availability does not preclude the possibility of some people experiencing food shortages amidst conditions

of ample food. In other words, despite the availability of sufficient food supplies, many people suffered from hunger due to their inability to access them. This phenomenon is what is referred to as the hunger paradox (Lasa 2005). In short, the FAA approach, which focuses on food availability, failed to sustain food security in some countries (Simatupang 1999).

In the 1980s, a paradigm shift occurred in the notion of achieving food security, from simply stressing food availability to ensuring access to food at both the household and individual level. The new concept of food security induced a shift to a graduated form of food security, referring to a process that considers individual, household, and regional food security – in that order – as a more reliable measure than the other way around. Previous concepts of food security were based on the premise that regional food security engenders food security at the household level, which, in turn, leads to individual food security (Maxwell and Slater 2003).

In this dissertation, I will use the household level as the unit of analysis and will expand from there to the group level. I follow what Maxwell as well as Bentley and Pelto state about the importance of "measuring" food security at the household level: "First, the household is the logical social unit through which to view the question of access to food, in spite of intra-household inequalities in the distribution of food (Bentley and Pelto 1991). This demands not only knowledge of overall household needs and consumption, but also an understanding of intra-household dynamics affecting procurement and distribution of food. Second, household food security should be considered a necessary but not sufficient condition for adequate nutrition. […] Third, food security must be understood in terms of the rationality and logic of the persons or social units involved" (Maxwell 1996: 291-292).

Based on the concept of food security developed by FAO (2001), there are four dimensions of food security to be considered, namely: food availability, accessibility, vulnerability, and sustainability. "These four dimensions are interconnected and all must be present for people to be food secure, as no single element is able to ensure and sustain food security on its own. Food insecurity occurs when one or more of these elements is weakened and can impact on the national, household and individual levels. Food security at one level does not indicate food security at another" (Jember and Asmamaw 2014: 7).

Maxwell and Frankenberger (1997) define these four dimensions of food security at the household level. Food *availability* relates to the sufficiency of food for the entire household over a given period (a day, a week, a month, a year, etc.). The availability of food is closely related to how households acquire food, i.e., whether they mostly rely on their own production as opposed to purchasing food or receiving food (aid) from others.

The second dimension is *accessibility*. This dimension is derived from concerns over food entitlement raised by Amartya Sen in the 1980s. Despite the availability of abundant food, some people may suffer from hunger because they do not have sufficient access to it. In other words, abundant food supply cannot in itself improve food security for individuals without the right of access to food at the household level (Amartya Sen in Lassa 2005). Thus, *accessibility* is associated with the right to food: the right to produce, purchase, exchange, and receive food (Maxwell 1996).

The third dimension is *vulnerability*, which is sometimes also referred to as *security*: secure access to enough food. This includes the notions of risk and risk avoidance such as crop failure, natural or other disasters, crises, and other shocks (such as price volatility,

market failures, political and social instability, as well as other external factors) to achieve food security (Maxwell and Frankenberger 1997).

The last dimension is *sustainability*, alternatively referred to as *time dimension* (Maxwell and Frankenberger 1992) or *stability* (Jember and Asmamaw 2014). Maxwell and Frankenberger define this dimension as "secure access to enough food at all times" (1992: 15). A sustainable food security system must be strong enough to absorb various risks, including but not limited to periods when domestic production declines.

The food (in)security status reflects the condition in a given household with respect to food availability, access, vulnerability, and sustainability, rather than that of each individual in the household. However, different individuals in a household may face different degrees of food insecurity or vulnerability to suffering from hunger.

Meanwhile, livelihood security is "the assessment of a household's sustainable and adequate access to income and resources, to meet basic needs" (Frankenberger and McCaston 1998: 30-35). Analysis of livelihood security considers the availability, access, quality, and utilization of incomes and resources necessary to fulfilling basic household needs. In light of that, it is also important to discuss the concept of vulnerability in relation to livelihood and food security (see Niehof 2010). The concept of livelihood vulnerability mainly refers to the relation and the differences between external and internal conditions. The external conditions of livelihood vulnerability consist of risks, shocks, and stress to which individuals or households are exposed. The internal conditions refer to a household's ability to cope with problems that might arise from external factors without losing its capabilities and assets (Chambers 1990 in Niehof 2010: 26-28). In the context of food security, households with vulnerable livelihoods will have problems providing food for family members in a sustainable way. Households with sustainable livelihoods will achieve a higher level of food security.

The interconnection between food and livelihood security can be seen as follows. Food security is a function of the ability to have access to assets and income, while the lack of assets, such as land in agrarian societies, and low income leads to food insecurity. Food insecurity may be transient, acute or chronic, depending on the ability of the household to cope with seasonal fluctuations in food insecurity. Acute shortages in food availability, food prices, and income cause acute food insecurity. Without a coping mechanism, this will lead to chronic food insecurity. Households that have the capacity to cope with seasonal food insecurity become resilient, hence food secure; those that cannot cope are referred to as fragile, hence have high vulnerability to food insecurity (Lovendal et al. 2004).

A useful tool to make the link between food and livelihood is the Sustainable Livelihoods Approach (SLA) (see Lovendal et al. 2004 and Figure 3). The SLA looks at the various assets a society has at its disposal in the form of human, social, natural, physical, and financial capital. In addition, it takes into account mediating factors, such as regional and central government policies, programs, beliefs and attitudes, and laws in the regional and national level or social systems. These factors have a significant influence on livelihood strategies, household food distribution, and health-related activities. Together, the assets, mediating factors and activities determine intermediate outcomes with respect to food access at the household and individual level, as well as the biological utilization of food. This then allows for an assessment of food security.

The SLA also provides space for looking at coping strategies. Coping strategies are generally referred to as the ways and methods households employ to adjust their food consumption to shortfalls in terms of availability and access to food. According to Maxwell et al. (2003), coping strategies encompass everything employed by households to address impending and current shortages of food for their families. Households with better coping strategies are better able to avert falling into food insecurity than those with limited strategies. In the context of the Orang Rimba, the SLA can contribute to our understanding of how various factors together determine food security.

In Indonesia, food security policy, also known as 'food policy', has been transformed from time to time. Indonesia has articulated food security as follows in Law No. 18 of 2012 concerning Food or *Undang-undang No. 18 tahun 2012 tentang Pangan*: "[…] a condition whereby food needs of the country up to the household level are met, as reflected by sufficient availability of food in terms of quantity and quality, safety, prevalence, accessibility, nutritional value, affordability, compatibility with religion and culture; in order to achieve a healthy, active, and productive life in sustainable way." As defined in this law, food security clearly embodies the dimensions of availability, access, religious and cultural acceptance, as well as biological utilization. Although implicitly present, the dimensions of security/vulnerability and sustainability/stability over time are less pronounced.

To measure food security and vulnerability at the macro level (national, provincial, and district levels), Indonesia uses the Food Security Map (World Food Programme 2015). The map is produced jointly by the Indonesia Food Security Council, the Ministry of Agriculture

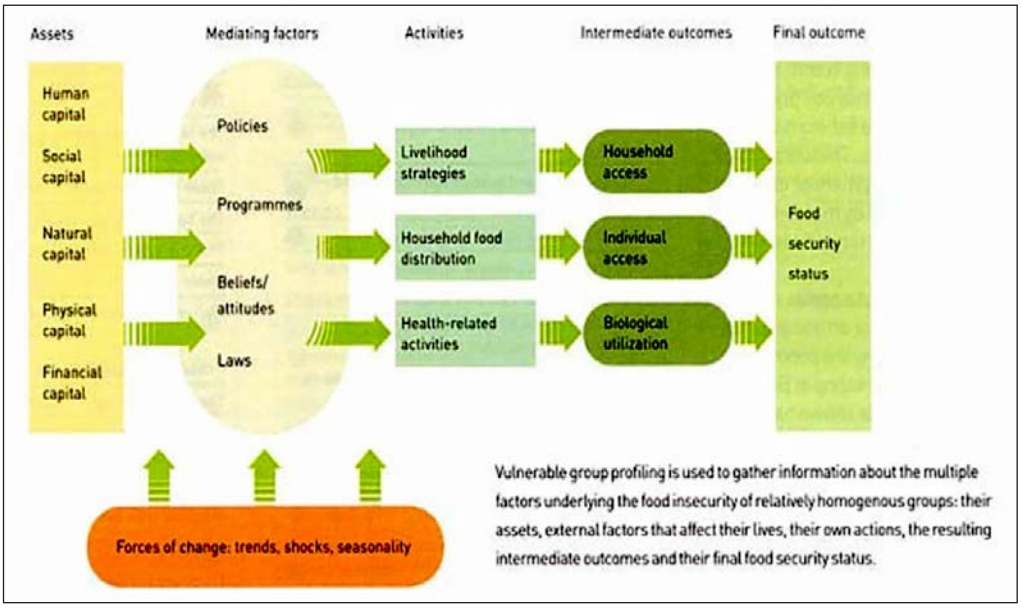

Figure 5. The Sustainable Livelihoods Framework for Food Security Analysis
Source: Lovendal et al. 2004: 21

and the World Food Programme and is presented in the "Food Security and Vulnerability Atlas" which is published once every five years. The Food Security Map is deemed vital in handling food security problems by policy makers at the district, provincial, and national government levels. It is important to note here that for the purpose of this dissertation, I use the 2015 version instead of the latest version of 2020, since this was the version relatively relevant to my data collection. The map is based on the premise that food and nutrition security is multidimensional and requires the analysis of a range of parameters. The atlas uses official statistics from the Statistics Indonesia to measure food and nutrition security through a set of indicators that represent three dimensions of food and nutrition security: aggregate food availability, households' access to food, and individuals' food utilization. Nutrition considerations, including the affordability and availability of nutrient-rich foods, permeate all three dimensions. The following indicators are used (Ministry of Agriculture and World Food Programme 2015):

- Food availability: consumption to net cereal availability ratio;
- Food access: population below poverty line, access to electricity, and villages with connectivity;
- Utilization: infant mortality rate, life expectancy of children <1, children underweight, access to safe drinking water, population living > 5 km from healthcare center/access to healthcare centers, and female illiteracy rate.

Based on the above indicators the Food Security Map indicates that Indonesia experiences both severe food insecurity as well as high food security, with the three highest priority categories comprising over 30% of all districts and the lower priority categories adding up to almost 70% of districts (Table 2).

Table 2. Food security classifications Indonesia, 2015

Priority Number and color	Classification	Number of Districts	Percentage
1 (dark red)	Severely food insecure	14	3.9
2 (red)	Food insecure	44	12.1
3 (yellow)	Relatively food insecure	52	14.3
4 (dark yellow)	Sufficiently food secure	84	23.1
5 (light green)	Food secure	50	13.8
6 (dark green)	Highly food secure	119	32.8
	Total	**363**	**100**

Source: Ministry of Agriculture and World Food Programme 2015

Based on the data on which this map was produced, Jambi Province is a priority number five province, implying it is relatively food secure. However, it is important to look beyond the aggregate level, especially in rural areas. There is more to food security than meets the eye, and this can only be understood if we look more closely at variation within and between populations, as determined by socio-economic status, source of livelihood, and household composition. This is illustrated by the paradoxical situation that the province faces some food vulnerability even though households are able to fulfill at least 80% of their energy requirements. Some households have to spend at least 60% or more of their income on food, which undermines their capacity to satisfy other needs (Badan Pusat Statistik Provinsi Jambi 2010).

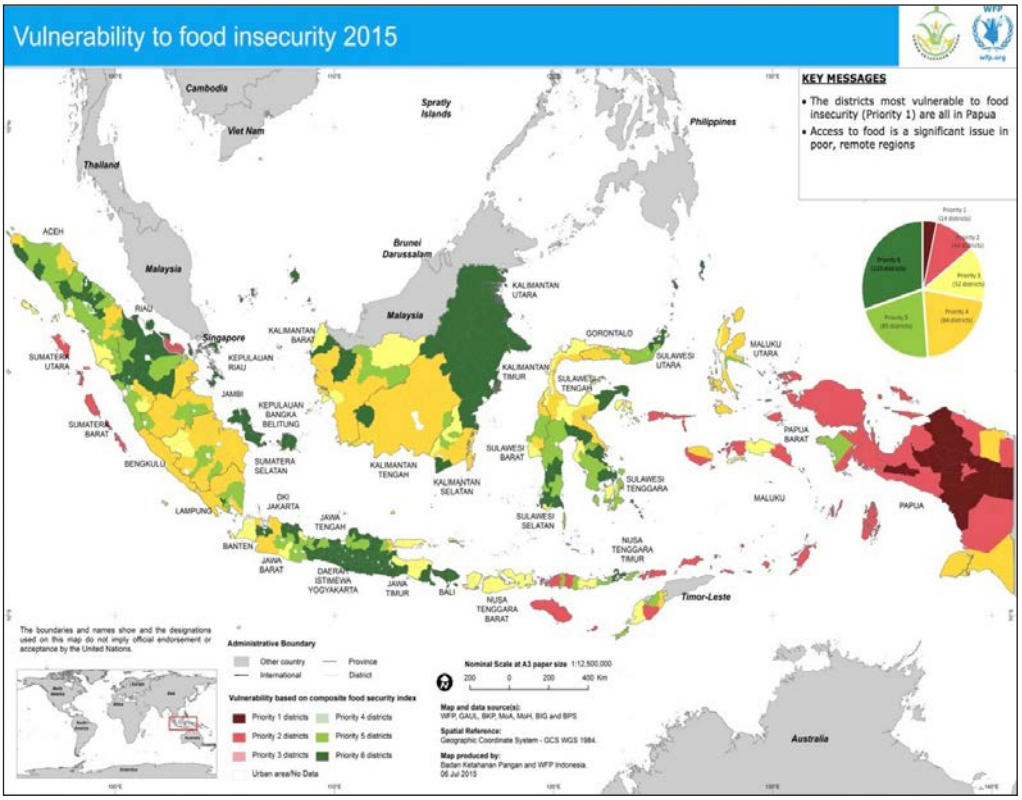

Figure 6. Food Security and Vulnerability Map of Indonesia, 2015
(Ministry of Agriculture and World Food Programme)

While the most recent Jambi Provincial Regional Plan, *Rencana Pembangunan Jangka Menengah Provinsi/RPJMP* (2017-2021), does not contain a food security program, its predecessor (2011-2015) includes a policy on food which is underpinned by the need to increase food production by expanding production areas. These areas include reclaimed swamps such as Tanjung Jabung Barat, Tanjung Jabung Timur, Muaro Jambi, Tebo, Bungo, Batanghari, Sarolangun, and Merangin (RPJMD Provinsi Jambi 2011-2015). One of the problems is that these areas are prone to regular flooding, which is likely to have a large impact on the success of the agricultural program and the diversification of food production. The program is meant to reduce the dependence on rice by promoting the growing of tubers, sweet potatoes, maize, soybeans, vegetables, and fruits. Not much is outlined in terms of increasing food access, however.

The anthropological perspective

The quantitative approach discussed above provides us with a macro-perspective of patterns of food security at the national and sub-national level. This is useful for the identification of priorities in addressing food security issues and for monitoring changes in the food security status over time. However, it does not allow for more nuanced

insights on local variations in food security, nor for explanations for such variation, which requires a more qualitative approach. The anthropology of food has a long history of providing such qualitative understanding of the cultural dimensions of food and eating. Approaches have differed and developed over time, with probably the main contrast being between structuralism and cultural materialism (see Mintz and Du Bois 2002, and de Garine 2004: 16-17, for overviews). The structuralist tradition, led by Lévi-Strauss in the 1960s, considers people's relationships with food to unconsciously reflect deep structural features of society, and does not pay much attention to the more practical aspects of food. In contrast, the cultural materialist view argues that people solely eat for practical reasons and that food preferences are mainly based on practical benefits (see Harris 1985). More recently, such sharp divisions have mostly disappeared and contemporary anthropologists are generally interested both in the practical and symbolic aspects of food (Macbeth and MacClancy 2004, Macbeth 2006, Darmanto 2020).

The ethnographic approach taken in this dissertation is suitable for gaining a detailed understanding of how and by whom food is locally obtained, prepared, and consumed. In addition, ethnography provides insights in how food is culturally and socially perceived, and the role it plays beyond meeting nutritional needs. This is essential in order to understand the food practices and needs of specific groups of people, especially when these practices and needs may differ from surrounding populations, as is often the case for hunter-gatherers.

Food procurement and consumption are important issues in classic ethnographic studies on hunter-gatherers. A major theme includes energy expenditure and caloric intake (see Kelly 2013: 46-76 for an overview). For instance, using the optimal foraging approach, Mintz and Du Bois (2002) show that hunter-gatherers' food strategies are usually aimed at maximizing their caloric intake per unit of time and therefore argue that energetic costs of food strategies should be taken into account. A criticism of optimal foraging models is that they do not take into account the cultural value that may be attached to certain food items or subsistence strategies, such as prestige or taboos (Kelly 2013: 76).
Another important theme related to hunter-gatherers' food security is food sharing. The strong social obligation to share food with relatives is known to be a central feature of both economic and social organization among hunter-gatherers (Woodburn 1982). Kaplan and Hill (1985) discuss this issue in relation to the reciprocity among the Ache foragers in eastern Paraguay. They show that reciprocal food sharing for hunter-gatherers not only ensures individuals' access to secure meat, honey, and other collected resources, but also reflects a communal strategy adopted during times of food shortage. By using this mechanism to increase food security at the group level and by prioritizing those most in need, food sharing helps the group to survive during food crises that are attributable to seasonal variations and conflicts. Hunt (2000) looks at food sharing from an economic anthropological perspective. He shows that meat sharing can be defined as an economic allocation with a strong influence on politics, property rights, and an egalitarian social organization. Furthermore, he argues that documenting the complexity and dynamics of food sharing can serve as a way to understand egalitarian societies. Darmanto (2020) has made similar arguments for sharing ethics on Siberut, off the Sumatran coast.

A final important theme in studies on hunter-gatherers and food is how social and environmental change impacts their subsistence strategies and diets. This theme is receiving most attention in relation to tropical hunter-gatherers, many of whom depend on forests. Arnoldi et al. (2011) explain the link between forests and food security: forests provide a wide range of products for forest-dwellers that are crucial for their food intake, their health, and their well-being. Moreover, even in times of food shortage or food insecurity forests may still provide various kinds of emergency food (Hagen et al. 2017). In a review of studies on the contribution of forest foods to diets, Rowland et al. (2016: 11) show that '[…] forest loss may result in […] adverse consequences on nutrition for local people.' This has been confirmed by a recent study on the impact of forest loss on child dietary diversity in West Africa (Galway et al. 2018).

Indeed, many contemporary hunter-gatherers face high vulnerability to food insecurity (Headland 1987, 1991; Dounias and Froment 2006, 2011), and this is especially true for the Orang Rimba, as recent events have proved (Wardani 2011). Often this can be related directly to the degradation or disappearance of the forest resources on which hunter-gatherers depend. Ecological and cultural changes have implications for the food security and general health of forest-dwelling hunter-gatherers. Dounias and Froment (2016) argue that in a globalizing world, hunter-gatherer societies need to make socio-economic, cultural and political adjustments, simply because the modified environment does not support the old way of life anymore.
In specific cases, life in the forest may no longer be feasible at all. In a socio-economic study on the Punan of East Kalimantan, Levang et al. (2005) note that forest-dwelling hunter-gatherers may not necessarily be better off if they keep living inside the forest. Based on the observation that the Punan have by now largely switched from dependence on forest products to other sources of livelihood, they conclude that: "…. we should not focus on romantic ways to help the last Punan to stay in the forest if it is not their choice. To forest people, the best choice might well be to get out of the forest, in order to get out of poverty" (2005: 231).
This dilemma must also be seen in the context of how the forests in question are being managed. It is often assumed that if it is forest loss that forms the main threat to hunter-gatherers' livelihoods, effective forest protection can potentially reverse that situation. Paradoxically, however, this is not necessarily the case. Much depends on the extent to which resident hunter-gatherers continue to have access and control over natural resources and culturally important sites once protected areas are established. Food security may be seriously undermined in situations where former hunting and gathering grounds have become off-limits for conservation or eco-tourism purposes (Lewis 2016; Colchester 2018). A recent example of this includes the case of the Kwe San in the Bwabwata National Park in Namibia, who have been violently denied access to their foraging grounds (Heim 2020).

The next section will outline how I combine a quantitative and qualitative approach to assess how contemporary Orang Rimba diets reflect various strategies to adjust to changing social and ecological circumstances.

1.5 Research methods

Food is the focus of this study. For the Orang Rimba, as for others, food relates not only to meeting their nutritional needs, but also to their culture and customs, which are different from other ethnic groups in Indonesia, and especially from those of the Malay village people (Orang Dusun/Melayu).

The Orang Rimba are commonly portrayed as primitive people who are markedly different and exotic (see Sager 2008), and this includes their food habits. Having a background in economics, it is perhaps not surprising that my first encounter with the Orang Rimba in 2006 ignited similar thoughts in me. However, with time, I learned that anthropological fieldwork can provide an alternative way of understanding others. I agree with Elkholy (2016) that to gain a proper understanding of the context of the time and space of the Orang Rimba's transformation processes, one must embed oneself into long-term ethnographic fieldwork.

Studying food is complicated and, as Macbeth has argued: "human food is an excellent topic for multidisciplinary discourse" (Macbeth 2006:1). Indeed, this dissertation is based on my economic background as well as on an anthropological approach, which is built on experiences – observations, conversations, interviews, and participation in Orang Rimba's daily lives – that complement quantitative food records, data analysis, and interpretation, as well as the literature review. This study combines quantitative and qualitative research methods and draws on both primary and secondary data.

Primary data collection will be described in detail below. Secondary data on geography, demography and resettlement programs were gathered from government offices like the *Badan Pusat Statistik* or Statistics Indonesia and *Kementrian Sosial* or the Ministry of Social Affairs. Additional information about the Orang Rimba was obtained from academic studies, newspapers, magazines, and unpublished internal documents of WARSI and government organizations, such as the Ministry of Forestry. In addition, WARSI, a local NGO, provided digital maps on the locations of the Orang Rimba and supplied the 2010 raw data on the population of the Orang Rimba.

Primary, quantitative data on food intake, and consumption patterns were collected through a household survey among a total of six households living in three Orang Rimba groups. As will be further explained in the section 'Description of the data on food', particularly the section 'Daily food intake', depending on the sites, these data were recorded for a period of two up to six months, resulting in an extensive database on food intake and food origins.

The methodological basis for this approach was derived from Niehof's study on food security indicators (2010). I was also inspired by Macbeth and MacClancy (2004) with respect to the methods of researching food habits, as well as by Macbeth (2006) on the subject of food preferences. Using food security indicators measured during a specific timeframe (e.g., one day, one month, or one year) reveals the degree of a household's food security and food consumption trends. This approach helped me to identify a household's capability to access sufficient food, in terms of quantity, quality, and food preferences. It also revealed the origin of the food, i.e., whether it was obtained from the household's own production (hunting, gathering, farming), bought from a market or store, or obtained through sharing.

The main unit of analysis in this study is the 'household'. The Statistics Indonesia (BPS) defines the household as "an individual or group of people living in a physical building or part of it, who usually commonly provide for food and other essentials of living. Common provision for food means one group organizing daily needs for all of household members" (BPS 2017). In practice, a household usually is a nuclear family that consists of a father, a mother, and their children. In some cases, a household may also have additional family members like grandparents and other close relatives.

The standard Indonesian conception of the household is similar to that of the Orang Rimba nuclear family, which generally consists of a husband, the wife or wives, and their children. Sometimes the household also includes a single grandparent or other close relatives who are living in unfortunate conditions, for instance due to loss of a spouse or child(ren). Together they organize the provision of daily needs, especially food, for their own household. As will be detailed in the following chapters, men generally are responsible for providing cash income or other goods (such as clothes, motorbikes, cellphones, and food supplies), while women are responsible for tasks such as the management of expenditures and distribution of goods, food gathering, fetching drinking water, collecting firewood, and taking care of the children.

To complement the quantitative household records on food intake, I used an ethnographic approach to understand the cultural context of food provisioning and consumption. Through in-depth interviewing and participant observation, ethnography has enabled me to grasp the Orang Rimba's perceptions, attitudes, values, belief systems, and norms regarding food security. Specifically, this has resulted in qualitative data on the classification of food and food taboos. It has also allowed me to understand the relationship between livelihoods, knowledge, and cultural practices and how these are adjusted in response to the challenges the Orang Rimba face. Ethnographic methods have further helped me to observe and document the complexity of Orang Rimba's relationships within and outside their own groups.

While the historical analysis on food security using combined methods is typically limited in the context of the Orang Rimba, this dissertation is focusing only on the food intake data gathered during the fieldwork. In total, I collected 2,520 intake records among the three groups of the Sako Tulang, the Terab, and the Air Hitam. The data collection took place during various periods of fieldwork of 21 months in total, spread across 2012 to 2016. With this set of data, I managed to analyze the patterns of the food production and consumption of the three groups that lead to the food security condition of the Orang Rimba. In the past, ethnographic accounts on the Orang Rimba often mentioned in general terms the types of food the people were eating and whether they obtained it through hunting and gathering or otherwise. More detailed analyses however were never given and that is why it is very difficult to discuss the food security of the Orang Rimba in earlier times. Governmental reports both in colonial times as well as after Indonesian independence often mentioned the irregular production of food and sometimes even made statements about the occurrence of hunger among the Orang Rimba without substantiating such statements (see for instance KDepartemen Sosial 1974).

Site selection

The Orang Rimba are not a homogenous population. Instead, there is considerable internal

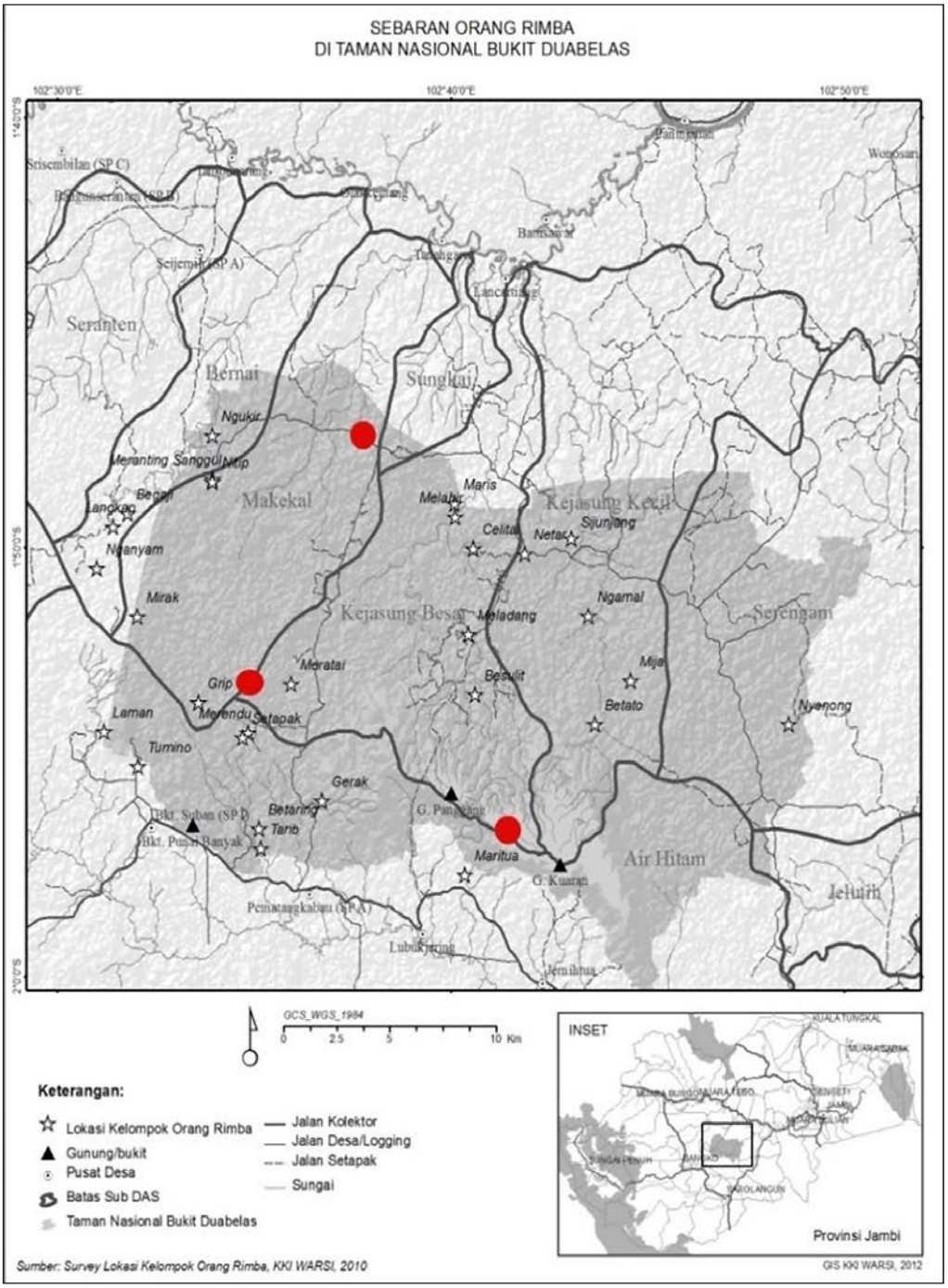

Figure 7. The riverine areas and group locations of the Orang Rimba in Bukit Duabelas
Notes: Source of map WARSI, 2012. The red dots represent the research sites of the author

variation in terms of livelihoods, mobility, dependence on the forest, and interconnections with the outside world. In order to gauge how these differences relate to food security, three groups were selected.

The Orang Rimba groups that are central to this study mainly live in an area that is crisscrossed by rivulets of the Batanghari River. They are surrounded by Malay people living along this river. Specifically, they live in the transition zone between the plains and the foot of the Bukit Barisan (Barisan Hills). From the main Batanghari River, the Orang Rimba follow the smaller watercourses of the Makekal, the Kejasung, the Terab and the Air Hitam. These smaller rivers have sub-branches, and these are the areas where the Orang Rimba live. However, in terms of formal administrative arrangements, the Orang Rimba live in the three districts of Merangin, Tebo, and Batanghari (Figure 7).

The three groups that I have studied represent three different geographical landscapes: inside, surrounding, and outside the Bukit Duabelas (see the red dots in Figure 7)[7]. Aside from location, these groups vary in terms of livelihood and settlement patterns, and this also reflects varying adjustments to recent developments among the Orang Rimba. The expectation from the selection of these three groups is to understand the vulnerabilities of various kinds of challenges, and also the coping mechanisms that the Orang Rimba have in terms of food insecurity, while living in different geographical landscapes both inside and outside the national park as well as in its border areas

I chose the Sako Tulang group to represent those Orang Rimba living outside the forest (Chapter III). They are the most 'settled' group as they are heavily involved in rubber farming. In spite of this, they still preserve their traditions, albeit in adaptive ways. For instance, this group still practices some hunting and gathering, as well as the *melangun* ritual, but all of these are adjusted in time and scale as a result of their high dependency on commercial agriculture.

The Terab group resides on the southern border of Bukit Duabelas. They are the most mobile group and represent the Orang Rimba who lead a nomadic lifestyle both in- and outside the park (Chapter IV). In spite of the many pressures on their livelihood, they have adopted a number of adaptation mechanisms to deal with forest degradation, the massive growth of plantations (both rubber and oil palm), and interaction with neighboring ethnic groups.

Finally, the Air Hitam group has settled along the Kedundung Muda River in the southwestern part of Bukit Duabelas (Chapter V). Living inside the Bukit Duabelas, they more or less maintain their traditional way of life, although they too, face several challenges in terms of their livelihood, such as the encroachment of the Bukit Duabelas Forest. Moreover, they gradually transform from being mobile to leading a semi-sedentary life focused on rubber-planting.

Fieldwork

In total, I spent about 21 months doing fieldwork in Jambi between 2012 and 2016. From June to October 2012 and in March 2013, I travelled around in the Bukit Duabelas area

[7] The map was produced in 2012 and reflects the situation of that year. By the time I conducted my fieldwork, the mobility of the Orang Rimba and the forest cover changed due to many factors.

to identify potential locations for my research and collect preliminary data on edible wild animals and plants. I visited many *tumenggung* (leaders) of the Orang Rimba from the western, southern, and eastern part of Bukit Duabelas. While during this explorative period I spent the most time with the Terab group, based on the preliminary data collected it was decided to do comparative research in the three groups mentioned above. After a stay in the Netherlands in late 2012 to process the initial data, I spent most of 2013 in the field and in Jambi city, with a short break in Yogyakarta in May and June due to a health problem. From July to October 2013, I divided my time between the Terab and Sako Tulang groups, with regular visits to Jambi city; spending two months with each group to collect daily food intake data. Subsequently, my field assistants (usually young Orang Rimba men) continued to record the daily intake data. In November 2013, I began the same exercise, also with the help of my field assistants, for the Air Hitam group. In January and February 2014, I travelled between the three sites, monitoring the data gathering process undertaken by my field assistants, and gathering additional information and updates on relevant events for each group. Subsequent field trips were made in August 2014, March 2015, and finally in May-June 2016, in order to confirm, complete, and update the data. The practical arrangement of my fieldwork was different for each group. During the beginning of my fieldwork among the Sako Tulang group, I used my own tent, which I constructed in the vicinity of my field assistant's house in Sako Tulang. After some time, I asked him to build a simple wooden house for my stay. He allowed me to stay in his house instead. During my stay in his home, I ate with the family. This made my data collection easier because I recorded the meals that I ate as well. However, for reasons of personal preference I limited myself to only eating fish, wild pig, and deer. I didn't eat other wild animals such as snakes, lizards, and turtles. My host seemed to understand this well and let me eat what I preferred to eat. Staying in the same house with my informant had both advantages and disadvantages. My proximity to the Orang Rimba also meant I was a witness to some internal (family) conflicts, something that I had not previously experienced, but that I had to face as part of my fieldwork.

In Terab, I initially stayed in the two-story wooden house that belongs to WARSI, and which serves as their field office. The ground floor is a communal space under the management of the Terab group and contains the kitchen and a meeting place. The second floor is multifunctional and acts as a study room for the children and a meeting room, and it provides a bedroom for WARSI's field staff. I could avail of the services and assistance of WARSI staff during my first fieldwork trip, but during subsequent fieldtrips I stayed with the Orang Rimba using the second floor of the WARSI house mainly as a rest area and for writing. During my later fieldwork in Terab, I followed the group's *melangun* movements. However, since Orang Rimba custom prescribes that outsiders are not to stay with them during *melangun* as they may bring sickness or bad luck, I stayed around 300 meters away in my own tent.

During my fieldwork among the Air Hitam group, I usually stayed either close to one of my key-informants' houses in my own tent or in a hut that belonged to WARSI near the Kedundung Muda River. The hut's location was beneficial to my research since the river plays a key role in daily activities like cooking, washing, and other domestic chores. At

night, the hut was usually full of people, including my key informants, discussing issues I wanted to learn about. Also, from time to time it was used as a school for children living inside Bukit Duabelas. Importantly, as the hut is located at the junction to the nearest village and market, it served as a transit area and take-off point for the Orang Rimba who transport their forest products to the markets. The busiest day was Tuesday, a market day. I also occasionally stayed in WARSI's field office in Air Hitam (Bukit Suban), which serves as a meeting place for the NGO and the Orang Rimba of Air Hitam.

The role that the *jenang* and *waris* (briefly patron and middleman, but see Chapter II) play among the Orang Rimba has been well documented (see Sandbukt 1984; Persoon 1989; Prasetijo 2007; Sager 2008; Wardani 2011). In my view, the roles that *jenang* and *waris* play today has been transformed and has wide-ranging functions. These individuals represent agents of change for the Orang Rimba. The middleman's role is still crucial, but has been modified so that it is no longer just about representing the economic interests of the Orang Rimba, but it is now also a force that underpins political and social changes. The middlemen are the intermediate persons for the Orang Rimba in terms of making contact with other parties such as government officials, plantation companies, NGOs, and other ethnic groups. Such a role can be played by students/researchers, government officials, *toke* (traders or middlemen), or NGOs. In some cases, Orang Rimba themselves have taken up that position. Despite the negative connotations associated with the role of *jenang/waris*, i.e. that middlemen are self-serving, the Orang Rimba need the *jenang/waris* as allies in order to protect their interests.[8] Both sides, the Orang Rimba and the current *jenang/waris*, have the ability to re-define their positions strategically.

I feel that, in addition to meeting the expectations of the main objective of doing research on food security among the Orang Rimba, I have also had a role as the Orang Rimba's *jenang/waris*. Initially, I did not realize that I had unintentionally taken up that role, but the intensity of my fieldwork with constant contacts with my informants catapulted me into that position. On many occasions, in addition to collecting data, I became involved in the groups' internal meetings to discuss their concerns and issues. Or I was called into meetings in Jakarta[9], and put in a position to speak about or even on behalf of the Orang Rimba with other parties. At times, I found myself involved in the Orang Rimba's trips to villages to buy groceries or to obtain medical services. On other occasions, I was involved in the process of selling their rubber or palm oil nuts to the middlemen. Often, other ethnic groups considered my position in the Orang Rimba group as somewhat awkward, especially as I was the only 'outsider' woman. One merchant seller in Pauh District once asked me whether I was the wife of one of the Orang Rimba men, since I always travelled with them. The fact that they always asked me to accompany them, especially when dealing with money (in most cases, buying things), showed the confidence they had in me while joining them, which enabled them to get better prices for their products and pay fair prices for their purchases from local markets.

[8] See the message sent out by the Tumenggung of the Terab group about his expectations of me in Chapter IV.

[9] In March and April 2015, *Lembaga Pengetahuan Indonesia* (LIPI, the Indonesian Institute of Sciences) and *Komisi Nasional Hak Asasi Manusia* (Komnas HAM, the National Commission for Human Rights of Republik Indonesia), invited me as resource person in discussing the case of 14 Orang Rimba who starved to death in early 2015.

This kind of relationship also enhanced my confidence in terms of collecting data. In addition to participatory observation, collecting quantitative data on daily food intake and interviewing informants through unstructured, semi-structured, and structured interviews, became more manageable.

The languages I used during my daily conversations with them included Indonesian (Bahasa Indonesia), Malay (Bahasa Melayu), and the language of the Orang Rimba (Bahasa Rimba, or Beso Rimba in local terms). My key informants were fluent in Bahasa Melayu and Bahasa Indonesia as they actively interact with middlemen and others from neighboring ethnic groups in trading activities. Some of them can speak Javanese, my own native language, rather well. Even though my ability to speak Bahasa Rimba was limited, I managed to understand what my informants were saying in general. Bahasa Rimba is very important in discussions and community meetings that involve members of the Orang Rimba groups. However, for one-on-one interviews, I often used Bahasa Melayu and Bahasa Indonesia, which have some overlap with Bahasa Rimba.

Time

In this dissertation, I use many words that relate to *the past* and to *the present* (nowadays). Measuring time is challenging for most Orang Rimba. This is because they do not have and do not use the concepts of year or age in their lives. For this study, however, I had to identify certain important dates and events in the life of the Orang Rimba.

My key informants always perceive the term *in the past* as a comparative term. For them, the term *in the past* reflects a situation when forests, the mainstay of their livelihood, were still verdant and expansive. Forest degradation began in the 1970s (see Prasetijo 2011), when the government of Indonesia launched a number of development and transmigration projects and granted logging concessions at a large scale. The idea at that time was to minimize the disparity and population gap between Java and other islands, including Sumatra, Kalimantan, Sulawesi, Papua, and other eastern islands in Indonesia (Levang 2005, see Chapter II for further detail).
Indeed, the 1970s was a watershed period in the Orang Rimba's transformation process. This decade marked the completion of the Trans Sumatra Highway, which created a window of opportunity for investments in Sumatra. The opening of the highway was followed by a large number of transmigration projects. Since then, the numbers of modern, capital-intensive industries on Sumatra have soared, dominated by a growth in the export of natural resources and agricultural products. During the 1990s, logging industries and cash crop plantations emerged all over the island, including in Jambi Province.

Thus, in this dissertation, *in the past* generally refers to the period before the 1970s. This is closely related to the Orang Rimba's use of the term *in the past* to reflect their previous life of abundant forests and relatively limited contact with outsiders.

In the timeframe that includes the opening of the Trans Sumatra Highway, the

transmigration projects, and the arrival of the logging industry, my own research started at the time when cash crop plantations reached their peak. I started my PhD research in 2012, when oil palm on large-scale plantations as well as in small-holder fields had already become the main source of income in Jambi. In addition, timber industrial estates were well-established. By then, the geographical landscape of Jambi had already been transformed and was largely covered by oil palm and rubber plantations.

Description of the data on food

I collected two main types of data on food, namely: a) qualitative data on the wild animals and plants consumed by the Orang Rimba; and b) quantitative data on daily food intake. Before describing both types of data and the way in which they were collected, I will first reflect on how I selected key informants and assistants to facilitate data collection.
In choosing my key informants in each group I used a purposive sampling technique. "The purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts. Purposive sampling may also be used with both qualitative and quantitative research techniques. The inherent bias of the method contributes to its efficiency, and the method stays robust even when tested against random probability sampling." (Tongco MDC 2007: 147). I have consulted with the Orang Rimba expert of WARSI and discussed the preliminary identification on the potential key informants and respondents in certain groups that could support the objective of my research. The main selection criteria included that key informants should have adequate knowledge of the Orang Rimba culture and its social dynamics; be able and comfortable to communicate with non-Orang Rimba; represent at least the variation of household income (high and low), and have mixed types of livelihoods; and finally, be somewhat literate.

Edible wild plants and animals

For the collection of data on edible wild animals and plants, I used structured interviews. This was a long process which involved many participants making lists of edible animals and plants. This was done separately in each location. My key informants, who participated in identifying the food, ranged from *rerayo* (the elders) and adults to youngsters. I conducted group interviews in which most of the informants were men, although a few women also participated. Usually around five up to ten people participated, even though additional people often joined the interviews passively. *Tumenggung* and other *rerayo* were particularly suitable for this purpose. Interviews were conducted in the evenings, when everybody was at home. The initial lists of edible plants and animals were compiled in Bahasa Rimba. With the help of a biologist from WARSI, in May-June 2016, I was able to confirm the data and to collect both the species names and the common Indonesian equivalents for many animals and plants on the lists. However, with respect to the many types of fish consumed, I was only able to collect the local names and failed to collect the scientific and common names as there was no expertise on fish identification available.

Daily food intake

Central to this dissertation is using daily food intake analysis. Studies on the anthropology

of food are taking food intake into consideration as one of the main issues (see Macbeth and MacClancy 2004). As summarized by Ulijaszek (2004: 121-122) there are four basic approaches, namely: diet record, diet recall, diet history, and food frequency questionnaire. There are advantages and disadvantages to each method, and which method is the best depends on the specific conditions and local situation (i.e. purpose of the study, field circumstances, availability of time, and financial resources).
I chose an approach that fits the purpose of my study, which is to obtain general insight in the daily consumption patterns of the Orang Rimba. I did not aim to quantify the nutrient intake or caloric values. Thus, based on this purpose and specific circumstances in the field, I developed a food intake method that is closely related to what Ulijaszek (2004: 122) calls 'estimated food record'. It involves a record of all food as eaten over a certain period. Each day, during each meal, I or my research assistants recorded all components of that meal based on interviews with and observations of the households involved in my study. In addition, for each food component, the origin was noted. For instance, it was noted whether the food item was obtained from hunting, fishing, or buying. I recorded this information based on a format used by the Food and Agriculture Organization of the United Nations (FAO), see Table 3. However, since I did not collect data on snacks, I simplified the format as in Table 4.

Table 3. Template used by the FAO (Kennedy, Ballard and Dop 2013: 7)

Breakfast	Snack	Lunch	Snack	Dinner	Snack

Table 4. Template used for daily food-intake records in this study

Date	Breakfast	Lunch	Dinner

For the purpose of analysis, the specific food items listed in the daily food intake records were re-grouped into larger categories. There are existing guidelines on food categorization. The most commonly used food categorization is developed by FAO in the context of the Household Dietary Diversity Score (HDDS). It consists of 12 food groups, namely: cereals, fish and seafood, roots and tubers, pulses/legumes/nuts, vegetables,

milk and milk products, fruits, oil/fats, meat/poultry and offal, sugar/honey, eggs, and miscellaneous (Swindale and Bilinsky 2006: 2).
In the context of Indonesia, the categorization of food is based on the one used by the *Badan Pusat Statistik* (BPS) or Statistics Indonesia. There are 14 groups in the categorization, namely: grains, tubers, fish, meat, eggs and milk, vegetables, beans, fruits, oil and fats, drinks, condiments, other consumption, ready to eat/instant food/drinks, and cigarettes (Kementerian Perdagangan 2013).
Based on the two categorizations by the FAO and BPS, I developed a categorization that fits with the food consumption patterns of the Orang Rimba. It consists of the following four categories:

1. Carbohydrate
2. Animal protein
3. Fruit
4. Vegetable

Each category has its own subcategories, as presented below.

Carbohydrate:

1. Rice
2. Cassava
3. Taro
4. Wild tuber and other starchy foods

Protein:

1. Fish
2. Wild pig
3. Freshwater turtle
4. Hedgehog
5. Snake
6. Deer
7. Mouse deer
8. Bird
9. Frog
10. Lizard
11. Squirrel
12. Rat
13. Primate
14. Other
15. Unknown
16. Combination of above

The total number of households to be included in my primary data collection for daily food intake was six households in three locations, or two in each location. I collected daily food intake records for 180 days for two households in Sako Tulang and also for two households in Air Hitam. In Terab I recorded daily food intake for 180 days for one household and for 60 days for another household. The food intake records for the two households in each

group were combined into one data set to provide an average for the group as a whole. The food intake records were taken three times a day for breakfast, lunch, and dinner. In case no meal was consumed during a particular moment, the food intake record would say "no meal consumed". But for the sake of readability, hereafter, I use the word "meal" for all (potential) moments of food intake, that is three times a day. This produced 1,080 (potential) food intake records in Sako Tulang, 360 records in Terab, and 1,080 records in Air Hitam. Together this adds up to 2,520 food intake records.
For further analysis, I made frequency distributions for every category and I plotted this output in graphs. Frequency distribution shows the percentage of the frequency at which the Orang Rimba consumed a specific food category. It also shows how often each category occurs in the diet. This analysis helped me to identify patterns in the kinds of food consumed by my informants as representatives of the group (see Chapters III-V).
The recording of the daily intake of the Sako Tulang group began on 16 July 2013 and ended on 15 December 2013.

I chose two key informants from the Sako Tulang group as the basis for collecting data on daily food intake at a household level, namely the son-in-law of the group's leader, who acted both as key informant and my field assistant. He is literate thanks to a WARSI education program and often accompanied me to other households and during trips through the forest or to their forest fields. Together, we have worked on updating a demographic survey of the group, an analysis family relation of the Sako Tulang group, a sketch of the settlements, and an overview of their livelihood. We have also worked on identifying the assets belonging to households in the group. The second key informant owned five hectares of immature rubber plantation. His main source of income is the renting out of his land to farmers from neighboring ethnic groups on a yearly basis, while he also occasionally works as a laborer in the rubber gardens of other people. In addition, he is involved in hunting activities to ensure adequate food for his household.
The data collection on daily food intake in the Terab group started on 1 September 2013 and ended on 28 February 2014, but differed for the two households because sadly, one of my respondents passed away in the middle of this period. Consequently, the comparative analysis of data from the Terab group is varied: based on a six-month period for one household and a two-month period for another (see Chapter IV for detailed explanation of the situation). The first key informant from Terab acts as a *menti*, the equivalent to a modern public relation's role, a social position associated with high status and a 'more stable' income. He is one of a few informants with a relatively high level of literacy. In addition to serving as one of my key informants, he played the role of my field assistant[10] in the Terab group. My late second key informant from Terab was a representative of the *rerayo*, or elderly, without a political position in the group. He also had limited capacity to earn an additional income due to his poor health.
Collection of daily food intake data in the Air Hitam group took place between November 2013 and April 2014. This period was chosen because it covered both the dry and the wet

[10] Before choosing him, I previously worked closely with the *Wakil Tumenggung* or Deputy of Chief. However, in the middle of my research, he and some other households moved away from the main location of the Terab group. Even though he was still a key informant, he was excluded from the sample households for recording the daily food intake.

season. The two informants from whose households I collected daily food intake data in Air Hitam were both considered *rerayo* and they were well acquainted with the Orang Rimba customs. While one of them held an important political position as a *mangku*, a person who is in charge of custom- related issues, the other held no political position within the group. At this location, I hired three young men to act as my field assistants in recording the daily food intake data and interviewing, my main assistant being the son of the above-mentioned *mangku*. Additional assistants helped as porters, since the site was inside the forest and only accessible on foot; and with routine tasks such as cooking, collecting firewood, and drawing water from the river, as well as driving me to and from the village of S.P.I. by motorcycle.

In addition to the daily food intake data, I also conducted interviews with the Orang Rimba in the three locations on the edible plants and animals during my fieldwork period of 2013-2014. In that period, however, I only managed to collect the local names of the plants and animals. In 2016, with the help of a biologist from WARSI, I continued to collect information and I was able to verify the names in Bahasa Indonesia and the species (Latin) names. The detailed list on the edible plants and animals for the Orang Rimba based on their knowledge, regardless for consumption or otherwise, is provided in the annexes.

Studying food security in a certain community calls for observation of several elements, which are illustrated in the table below. The table was developed based on the references from Maxwell (1996) and OXFAM (2001), and adjusted by the author to fit in the context of the Orang Rimba.

Table 5. Indicators of food security

Elements of food security	Key Areas
Food availability	Food supply: Own production (through subsistence farming, for example) Hunting Gathering Buying Given (sharing and receiving)
Access	Control over land Household income
Vulnerability	Various pressures to forests Melangun traditions Other shocks: price volatility on the livelihood products (rubber, oil palm and other NTFPs) seasonal changes health condition across the seasons hunger concept
Sustainability	Coping strategies during crisis The role of aid programs from outside sources

The four elements and their key areas will be examined further in the analysis in Chapter VI to determine the Orang Rimba's food security status. In addition, the analysis is supported by the daily food intake data to document the food consumption trends among the Orang Rimba.

1.6 Limitations of the study

I am aware of the potential bias of the techniques used, and by using a combination of approaches I have attempted to minimize biases. However, limitations evidently remain. For instance, the daily diet records do not cover food from the forest or from other sources that is consumed as snacks (i.e. in between meals) because this happens outside the house. It is quite likely that 'snacking' forms a substantial part of diets, including that of children. This difficulty has also been noted in other diet studies on forest-dependent peoples which probably leads to an underestimation of forest food consumed on gathering and hunting trips (e.g. Rowland et al. 2016: 11; Kelly 2013: 65), but also of snacks consumed when visiting the market or shop.

In addition to eating, food security is also partly shaped by drinking. Indeed, food is defined as "any substance that people eat and drink to maintain life and growth" (Gross, Schoeneberger, Pfeifer, and Preuss 2000: 4). The amounts and types of drinks consumed are however not part of the analysis.

As regards fruits and vegetables, there are two main discussions about these two categories. First, the Orang Rimba rarely eat vegetables. In fact, their daily diet contains more meat than vegetables. Given the fact that the Orang Rimba often consume meat, it can be stated that their diet contains sufficient animal protein. To a lesser extent, however, the Orang Rimba have small home gardens in which they can grow cassava to add to their diet. Second, culturally the Orang Rimba consider fruits to be an important element in their food supply. In the past, the Orang Rimba supplemented tubers as their main diet with fruits, honey, wild animals, and other types of food they collected from the forest, albeit temporary. This is why the Orang Rimba classified seasons in their lives into several events (see Chapter II for more details). The consumption of fruits was relatively limited during my fieldwork due to the absence of a fruit season. In addition, the number of households may be relatively small. However, the level of detail may give clear indications and allows us to portray the food security situation of the Orang Rimba in a general way. As Laksono writes, "Findings in ethnographic research are not positioned to represent the problems faced by the communities in general since there are many internal differences. Ethnographic writings are a representation of what the researcher sees, hears, and feels when having interactions with local people so that the researcher's subjectivity cannot be avoided. Therefore, as a reflection, ethnographic research is not intended to make research of right and wrong or past mistakes but it is intended as an alternative to move forward towards positive change." (Laksono 2012: 3).

This dissertation intends to describe the current situation of food security status of the Orang Rimba on the basis of a limited number of resource persons alongside with the limited time spent during the research exercise, with the hope that the lessons learned from this dissertation may contribute to the current debate of food security status of

hunter-gatherer societies in a wider sense. Through the lens of food security, it is hoped that the dissertation can reflect the transformation process of the Orang Rimba in the current situation. Later on, the lessons learned can contribute to the recommendations on the way forward for hunter-gatherers, not only for the Orang Rimba but also elsewhere.

1.7 Ethical considerations

Doing research among the Orang Rimba was quite challenging. On the one hand, the Orang Rimba have their own traditions and culture which are quite different from other cultures in Indonesia. On the other hand, the Orang Rimba are also known to be a relatively "closed" community. It is not easy for outsiders to enter their lives. On the basis of my previous experiences with the Orang Rimba, I was able to make close contact with them as well as with WARSI. In addition, I have also worked towards fulfilling the requirements for obtaining the free, prior, and informed consent (FPIC) of the people involved (see Persoon and Minter 2011). For example, I have discussed my proposal and my research aims with the *tumenggung* at the beginning of my fieldwork. The same actions were also conducted individually with the households. With the assistance from WARSI, I visited groups of the Orang Rimba in TNBD to seek their permission as well as to explain the anticipated outcome and outputs of my PhD research. This included the potential risks and benefits for the Orang Rimba as well. One important aspect of these discussions was the expectation that my research could bring real benefits to the Orang Rimba. I have tried to inform the Orang Rimba as realistically as possible about this in order to avoid the risk of disappointment at a later stage.

Researchers, both international as well as national, who want to conduct research in Indonesia should also obtain research permits from various authorities (national as well as provincial, and local). Since my fieldwork sites were mostly inside or near the national park, I had to arrange a research permit from the Provincial Office of Bukit Dua Belas National Park. I managed to arrange this permit annually thanks to the full support of WARSI.

It was challenging to conduct research on food security among the Orang Rimba since they have a tendency to share whatever they have. Sharing is a key characteristic of their social life. I shared my concerns with the late *tumenggung* in Terab and he understood me well. For this reason, my assistants helped me to explain that I could only share my meals with the children that accompanied me during my stay in their group and these children were not my respondents' family members. I also did not bring types of food with which the Orang Rimba were not familiar, nor did I bring types of food that they consider forbidden to eat. Only once in a while, when I got back from Jambi, I brought small souvenirs for my key informants, mostly cloth or *kain*. In Sako Tulang, since I practically ate with my assistant's family, I followed their diet. I only brought limited amounts of rice, which was also part of their regular diet. In Kedundung Muda, I did share food with my field assistants, but not with the households that were involved in the daily food intake records. However, since serving coffee, tea, or snacks when people pay a visit in Indonesia is a sign of hospitality that cannot be avoided, there were moments when I did so when the Orang Rimba visited me.

In order to compensate for the time and efforts of my field assistants and the households involved in the daily food intake records, I did pay them. To measure the impact of this additional income in terms of their food intake was quite difficult for me. Most or all of my field assistants already have a relatively stable income not only from the products harvested from the forest or from their small plantations but also from external parties such as logging or plantation companies, NGOs, and other stakeholders.